

What is claimed is:

[c1] 1. A multi-processor digital set top box (STB), comprising:
a first processor for performing essentially all real time functions within the STB;
and
a second processor for performing essentially all non-real time functions within the STB.

[c2] 2. The STB according to claim 1, further comprising:
a memory operatively connected to a bus for temporarily storing received audiovisual data packets of a broadcast, wherein each of said first and second processors are also operatively connected to said bus;
a recording device for digitally recording said audiovisual data packets, and for transmitting said digitally recorded data packets to said memory; and
a decoder for decoding said audiovisual data packets for display on a display device.

[c3] 3. The STB according to claim 2, wherein the recording device includes at least one mass storage device.

[c4] 4. The STB according to claim 3, wherein said mass storage device is at least one of a hard disc drive, magnetic storage device or optical storage medium.

[c5] 5. The STB according to claim 2, wherein said first processor is a transport processor operatively connected to said bus and to an input port for receiving said audiovisual data packets from said input port.

[c6] 6. The STB according to claim 5, wherein said second processor is a host processor operatively connected to said bus and said memory for performing graphical-user interface (GUI) and browser functions; the STB further comprising:

an interface for receiving said audiovisual data packets from said transport processor, and for transferring said received audiovisual data packets simultaneously to said memory via said bus, and to said decoder,

said memory further including a buffer space for temporarily storing the audiovisual data packets received from said interface,

said host processor directing said memory to transfer said audiovisual data packets to be digitally recorded by said recording device, and

said interface adapted to receive said digitally recorded data packets from said recording device via said memory and said bus.

[c7] 7. The STB according to claim 6, said interface being further adapted to transfer said digitally recorded data packets to said decoder.

[c8] 8. The STB according to claim 1, wherein said real time functions performed by said first processor include controlling audiovisual data packets input to the STB, controlling conditional access within said audiovisual data packets, and controlling program guide data input to the STB.

[c9] 9. The STB according to claim 1, wherein said non-real time functions performed by said second processor include controlling graphical user interface (GUI) and browser functions to enable a user to send command data to the STB and to manipulate data on a screen of a display that is operatively connected to the STB.

[c10] 10. The STB according to claim 1, wherein the first processor perform real-time functions while the second processor performs non-real time functions associated with commands received from a user.

[c11] 11. The STB according to claim 10, wherein said user commands are transmitted to said second processor via a remote control device.

[c12] 12. The STB according to claim 1, wherein the STB is embodied as a digital video recorder (DVR).

[c13] 13. A digital video recording (DVR) device, comprising:

a transport processor for performing essentially all real time functions within the DVR, including controlling audiovisual data packets input to the DVR, controlling conditional access within said audiovisual data packets, and controlling program guide data input to the DVR; and

a host processor for performing essentially all non-real time functions within the DVR, including controlling graphical user interface (GUI) and browser functions to enable a user to send command data to the DVR and to manipulate data on a screen of a display that is operatively connected to the DVR.

[c14] 14. The DVR according to claim 13, further comprising:

a memory operatively connected to a bus for temporarily storing audiovisual data packets of a broadcast that are received from an input port, wherein each of said transport and host processors are also operatively connected to said bus;

a recording device for digitally recording said audiovisual data packets, and for transmitting said digitally recorded data packets to said memory; and

a decoder for decoding said audiovisual data packets for display on a display device.

[c15] 15. The DVR according to claim 14, wherein the recording device includes at least one mass storage device.

[c16] 16. The DVR according to claim 15, wherein said mass storage device is at least one of a hard disc drive, magnetic storage device or optical storage medium.

[c17] 17. The DVR according to claim 14, further comprising:

an interface for receiving audiovisual data packets that are sent from said input port to said transport processor, and for transferring said received audiovisual data packets simultaneously to said memory via said bus, and to said decoder,

said memory further including a buffer space for temporarily storing the audiovisual data packets received from said interface,

said host processor directing said memory to transfer said audiovisual data packets to be digitally recorded by said recording device, and

said interface adapted to receive said digitally recorded data packets from said recording device via said memory and said bus.

[c18] 18. The DVR according to claim 13, wherein the transport processor performs said real-time functions while the host processor performs non-real time functions associated with commands that are received from a user.

[c19] 19. The DVR according to claim 18, wherein said user commands are transmitted to said host processor via a remote control device.

[c20] 20. The DVR according to claim 13, wherein the DVR is operatively connected to at least one of a direct broadcast satellite system, digital video broadcast system, cable-TV system and off-air broadcast system.

[c21] 21. A processing method for a digital set top box (STB), comprising:
performing essentially all real time functions in a first processing within the STB;
and
performing essentially all non-real time functions in a second processing within the STB.

[c22] 22. The method according to claim 21, further comprising:
temporarily storing received audiovisual data packets of a broadcast that are subject to at least said first processing, wherein each of said first and second

processings are performed by communicating with designated components of the STB via a data bus;

digitally recording said received audiovisual data packets that have been subject to said at least first processing and temporarily stored;

retrieving said digitally recorded audiovisual data packets based on at least said second processing; and

decoding said retrieved audiovisual data packets for display.

[c23] 23. The method according to claim 22, wherein said real time functions performed by said first processing include controlling audiovisual data packets input to the STB, controlling conditional access within said audiovisual data packets, and controlling program guide data input to the STB.

[c24] 24. The method according to claim 22, wherein said non-real time functions performed by said second processing include controlling graphical user interface (GUI) and browser functions, thereby enabling a user to send command data to the STB and to manipulate data on a screen of a display that is operatively connected to the STB.

[c25] 25. A processing method for a digital video recorder (DVR), comprising:
a first processing that includes controlling audiovisual data packets that are received by the DVR, controlling conditional access within said received audiovisual data packets, and controlling program guide data input to the DVR; and

a second processing that includes controlling graphical user interface (GUI) and browser functions, thereby enabling a user to send command data to the DVR and to manipulate data on a screen of a display that is operatively connected to the DVR.

[c26] 26. The method according to claim 25, further comprising:
temporarily storing received audiovisual data packets of a broadcast that are subject to at least said first processing, wherein each of said first and second

processings are performed by communicating with designated components of the STB via a data bus;

digitally recording said received audiovisual data packets;

retrieving said digitally recorded audiovisual data packets based on at least said second processing; and

decoding said retrieved audiovisual data packets for display on said screen.

[c27] 27. A system, comprising:

a transmitter for transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission; and

a set top box (STB) for converting the received frequency signal back into the content signal and for processing the content signal, the STB including:

a first processor for performing essentially all real time functions associated with the received content signal within the STB; and

a second processor for performing essentially all non-real time functions associated with the received content signal within the STB.

[c28] 28. The system of claim 27,

wherein the content signal is embodied as a plurality of audiovisual data packets, wherein the real time functions performed by the first processor include controlling audiovisual data packets that are received by the STB from the system, controlling conditional access within said received audiovisual data packets, and controlling program guide data input to the STB from the system; and

wherein the non-real time functions performed by the second processor include controlling graphical user interface (GUI) and browser functions that enable a user of the system to send command data to the STB.

[c29] 29. The system of claim 28, wherein the STB further comprises:

a memory operatively connected to a bus within the STB for temporarily storing said received audiovisual data packets, wherein each of said first and second processors are also operatively connected to said bus;

a recording device for digitally recording said audiovisual data packets, and for transmitting said digitally recorded data packets to said memory; and

a decoder for decoding said audiovisual data packets for display on a display device.

[c30] 30. A satellite-based distribution system, comprising:

a transmitter for transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission to a satellite; and

a digital video recorder (DVR) for converting the frequency signal received from the satellite back into the content signal and for processing the content signal, the DVR including:

a first processor for performing essentially all real time functions associated with the received content signal within the DVR; and

a second processor for performing essentially all non-real time functions associated with the received content signal within the DVR.

[c31] 31. The system of claim 30,

wherein the content signal is embodied as a plurality of audiovisual data packets, wherein the real time functions performed by the first processor include controlling audiovisual data packets that are received by the DVR from the system, controlling conditional access within said received audiovisual data packets, and controlling program guide data input to the DVR from the system; and

wherein the non-real time functions performed by the second processor include controlling graphical user interface (GUI) and browser functions that enable a user of the system to send command data to the DVR.

[c32] 32. The system of claim 31, wherein the DVR further comprises:

a memory operatively connected to a bus within the DVR for temporarily storing said received audiovisual data packets, wherein each of said first and second processors are also operatively connected to said bus;

a recording device for digitally recording said audiovisual data packets, and for transmitting said digitally recorded data packets to said memory; and

a decoder for decoding said audiovisual data packets for display on a display device operatively connected to the DVR.

[c33] 33. A method of processing data, comprising:

transmitting a content signal received from a signal source, wherein the content signal is digitally encoded and converted to a frequency signal before transmission;

converting the received frequency signal back into the content signal; and

processing the received content signal within a set top box (STB), said processing including:

performing essentially all real time functions associated with the received content signal in a first processing within the STB; and

performing essentially all non-real time functions associated with the received content signal in a second processing within the STB.

[c34] 34. The method of claim 33, wherein the received content signal is embodied as a plurality of audiovisual data packets, the method further comprising:

temporarily storing said received audiovisual data packets that are subject to at least said first processing, wherein each of said first and second processings are performed by communicating with designated components of the STB via a data bus;

digitally recording said received audiovisual data packets that have been subject to said at least first processing and temporarily stored;

retrieving said digitally recorded audiovisual data packets based on at least said second processing; and

decoding said retrieved audiovisual data packets for display.

[c35] 35. The method according to claim 34, wherein said real time functions performed by said first processing include controlling audiovisual data packets input to the STB, controlling conditional access within said audiovisual data packets, and controlling program guide data input to the STB.

[c36] 36. The method according to claim 34, wherein said non-real time functions performed by said second processing include controlling graphical user interface (GUI) and browser functions, thereby enabling a user of the system to send command data to the STB and to manipulate data on a screen of a display that is operatively connected to the STB.

[c37] 37. A processing method within a satellite-based distribution system, comprising:

transmitting a content signal received from a signal source, wherein the content signal is digitally encoded and converted to a frequency signal before transmission to the satellite; and

converting the frequency signal received from the satellite back into the content signal and processing the content signal within a digital video recorder (DVR), said processing including:

performing essentially all real time functions associated with the received content signal in a first processing within the DVR; and

performing essentially all non-real time functions associated with the received content signal in a second processing within the DVR.

[c38] 38. The method of claim 37, wherein the content signal is embodied as a plurality of audiovisual data packets, wherein the real time functions performed by said first processing include controlling audiovisual data packets that are received by the DVR from the system, controlling conditional access within said received audiovisual data packets, and controlling program guide data input to the DVR from the system; and

wherein the non-real time functions performed by said second processing include controlling graphical user interface (GUI) and browser functions that enable a user of the system to send command data to the DVR.

[c39] 39. The method of claim 38, further comprising:

temporarily storing said received audiovisual data packets that are subject to at least said first processing, wherein each of said first and second processings are performed by communicating with designated components of the DVR via a data bus;

digitally recording said received audiovisual data packets that have been subject to said at least first processing and temporarily stored;

retrieving said digitally recorded audiovisual data packets based on at least said second processing; and

decoding said retrieved audiovisual data packets for display.

[c40] 40. A transmission system, comprising:

a transmitter for transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission, converted back into the content signal upon reception and processed by performing essentially all real time functions associated with the content signal, separate from essentially all non-real time functions associated with the content signal.

[c41] 41. The transmission system of claim 40,

wherein the content signal is embodied as a plurality of audiovisual data packets, wherein the real time functions include controlling audiovisual data packets that are received, controlling conditional access within said received audiovisual data packets, and controlling program guide data; and

wherein the non-real time functions include controlling graphical user interface (GUI) and browser functions.

[c42] 42. A satellite-based transmission system, comprising:

a transmitter for transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission, converted back into the content signal upon reception and processed by performing essentially all real time functions associated with the content signal, separate from essentially all non-real time functions associated with the content signal.

[c43] 43. The satellite-based transmission system of claim 42, wherein the content signal is embodied as a plurality of audiovisual data packets wherein the real time functions include controlling audiovisual data packets that are received, controlling conditional access within said received audiovisual data packets, and controlling program guide data; and wherein the non-real time functions include controlling graphical user interface (GUI) and browser functions.

[c44] 44. A method of processing data, comprising: transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission, converted back into the content signal upon reception and processed by performing essentially all real time functions associated with the content signal, separate from essentially all non-real time functions associated with the content signal.

[c45] 45. The method according to claim 44, wherein said real time functions include controlling audiovisual data packets, controlling conditional access within said audiovisual data packets, and controlling program guide data.

[c46] 46. The method according to claim 44, wherein said non-real time functions include controlling graphical user interface (GUI) and browser functions, thereby enabling a user to enter command data and to manipulate data on a screen of a display.

[c47] 47. A processing method within a satellite-based distribution system, comprising: transmitting a content signal, wherein the content signal is digitally encoded and converted to a frequency signal before transmission, converted back into the content signal upon reception and processed by performing essentially all real time functions associated with the content signal, separate from essentially all non-real time functions associated with the content signal.

[c48] 48. The method of claim 47, wherein said real time functions include controlling audiovisual data packets, controlling conditional access within said audiovisual data packets, and controlling program guide data.

[c49] 49. The method of claim 48, further comprising decoding said retrieved audiovisual data packets for display.

For filing